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Do maternal knowledge and paternal knowledge of children's whereabouts buffer differently against alcohol use? A longitudinal study among Finnish boys and girls

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Abstract

Background Previous research suggests that parental knowledge of the child's activities and whereabouts prevents adolescents' alcohol use. However, evidence on whether the positive effects of maternal and paternal knowledge are distinctive for boys' and girls' alcohol use is inconclusive. We examined whether perceived parental knowledge at age 13 prevents alcohol use at age 16, whether the effect of maternal and paternal knowledge was the same for both genders, and whether paternal knowledge had as strong an effect as maternal knowledge.

Method Adolescents answered a school survey in 2011 (age 13) and 2014 (age 16) in Finland (N = 5742). Perceived maternal and paternal knowledge was measured separately using a Parents' Monitoring Scale. The data were analysed via moderation regression modelling using Bayesian estimation.

Results Perceived maternal and paternal knowledge at age 13 predicted boys' and girls' lower alcohol use at age 16. For those who had not used alcohol at age 13, parental knowledge protected against an increase of alcohol use at age 16. Both maternal and paternal knowledge had a shielding effect against the increase of boys' and girls' alcohol use, but maternal knowledge had a stronger shielding effect than paternal knowledge.

Conclusions Both maternal and paternal perceived knowledge at age 13 buffers against the adverse development of alcohol use at age 16 for both genders. Underlining the importance of parent-child communication and knowledge about the child's activities should be a part of family health counselling and school health services.

1. Introduction

Adolescent alcohol use constitutes a major public health concern, even though recent trends show a decline in most European and North American countries (Looze et al., 2015). Research indicates that alcohol is the leading risk factor for disability-adjusted life years among youth aged 10–24 years (Gore et al., 2011). Alcohol experimentation and consumption emerge in early adolescence, and then increase during adolescent years. Early initiation and use are linked to later heavy drinking and early drinkers have an increased risk of using other substances, delinquent behaviour, academic problems, and impairments in neurological development (Ewing et al., 2014; Visser et al., 2014).

Parental influence on children's alcohol use and other risky behaviours has been studied extensively. Different dimensions of the familial environment, e.g., parent-child communication, parental modelling and control, parental support, parental disapproval of drinking and alcohol-specific rule-setting, have been identified as having an impact on adolescent alcohol use (Koning et al., 2012; Mares et al., 2012; Rossow et al., 2016; Ryan et al., 2010; Visser et al., 2012). However, a recent review of longitudinal cohort studies found only weak evidence for a prospective association between the parent–child relationship and adolescent alcohol use (Visser et al., 2012). Relatedly, a systematic review and meta–analysis on the effects of parental alcohol rules and risky drinking concluded that the existing research does not warrant strong conclusions on the associations, although parental alcohol rules were associated with lower degrees of risky drinking (Sharmin et al., 2017).

Among the factors related to parenting practices, parental monitoring has been among the key protective factors for alcohol use. Ryan et al. (2010) showed that parental monitoring was negatively associated with adolescent alcohol use and predicted delayed alcohol initiation. Parental monitoring in early adolescence also prevents involvement with peers that are prone to alcohol and drug use and other potentially dangerous activities (Oxford et al., 2000). In their systematic review and meta-analyses of longitudinal studies of modifiable parenting factors associated with adolescent alcohol misuse, Yap et al. (2017) concluded that parental monitoring was the strongest protective factor against alcohol initiation and use. The majority of the studies on parental monitoring that met the inclusion criteria for their meta-analysis were conducted in North America (n = 14). Four studies were conducted in the Nordic countries, one in the Netherlands, and one in Australia. The number of respondents among the studies varied between 200 and 2,329, and the age of the adolescents between 11 and 15 years.

This study builds on the previous research on parental monitoring and its impact, but instead of monitoring we use the concept of parental knowledge. The definition of parental monitoring has varied between studies, but according to a commonly accepted conceptualization (Dishion and McMahon, 1998, p. 61) parental monitoring is "a set of correlated parenting behaviours involving attention to and tracking of the child's whereabouts, activities, and adaptations." However, studies typically rely on the adolescents' own perceptions of how aware their parents are of their activities, the company they keep, and where they spend their time outside home or school (DiClemente et al., 2001). Furthermore, typical measures rarely include parents' actual monitoring behaviour, such as tracking and checking where and with whom their children spend their time (Stattin and Kerr, 2000). According to Stattin and Kerr (2000), parental monitoring is a proxy for the quality of the parent-child relationship. The knowledge that the parents acquire when their children voluntarily tell them about their activities enhances the parents' trust in their children, the cornerstone on the parent-child relationship. A recent Finnish qualitative study (Simonen et al., 2017) suggested that even though teenagers use misleading and diverse strategies to maintain trust, they also ask for rules and supervision, and do not strive for limitless freedom. In this regard, parental knowledge better captures the multidimensional nature of parent-child communication, comprising dimensions of information disclosure, trust-building and communicating authority.

While there is a vast amount of research on the impact of perceived parental knowledge and monitoring, less is known about the differences between perceived paternal and maternal knowledge, as well as whether maternal and paternal knowledge has differing effects on boys' and girls' drinking (Patton et al., 2016). Previous studies on parental monitoring have shown that girls are monitored more than boys (Svensson, 2003), that girls perceive more monitoring by their mothers than fathers (Li et al., 2000; Webb et al., 2002) and that parents are more accepting of deviant behaviour from boys than girls (Fagan et al., 2007). Girls are taught to value family relationships more and they are likely to be more attached to their parents, suggesting that the same level of parental involvement may have a stronger effect on girls than boys in preventing delinquent behaviour (Fagan et al., 2011; Kroneman et al., 2009; Keenan and Shaw, 1997). Meanwhile, some cross-sectional studies have also suggested that the quality of parent-child communication has a greater impact on girls' than boys' drinking behaviour (Choquet et al., 2008; Kelly et al., 2011a, b; Yeh et al., 2006), other research has demonstrated a greater impact on boys' behaviour (Borawski et al., 2003; Rothbaum and Weisz, 1994), and others still, that there are no gender differences (Hubbard and Pratt, 2002). In general, socialization models claim that boys and girls meet different expectations, punishment and reinforcement from their parents which, in turn, shapes their gender-

bounded attitudes, beliefs and behaviour (e.g., Maccoby, 1988). So far, very few studies have addressed gender differences in perceived parental knowledge. They all agree unanimously that mothers are more involved in their children's lives than fathers, and also receive the children's self-disclosure more often than fathers (Guilamo-Ramos et al., 2010). However, Stattin and Kerr's (2000) study from Sweden found no gender differences in parents' knowledge of their children's lives.

Evidence on whether the effects of perceived maternal and paternal knowledge are distinctive for boys' and girls' alcohol use is yet inconclusive. Our longitudinal study adds to the understanding on how gender, of both the parent and the child, affects the ways in which parental involvement prevents and moderates alcohol use in adolescence.

• Does perceived parental knowledge affect boys' and girls' alcohol use and prevent the increase of alcohol use by age?
• Has perceived maternal and paternal knowledge differing effects on boys' and girls' drinking behaviour?
• Has perceived paternal knowledge as strong an effect as maternal knowledge on boys' and girls' drinking behaviour?

Based on previous research and theoretical explanations, we expect that perceived parental knowledge of the children's activities predicts a lower level of alcohol use in adolescence and protects against growing alcohol use by age. Secondly, we hypothesize that parental knowledge has a stronger effect on girls' drinking than boys' drinking. Thirdly, we expect that maternal knowledge has a stronger effect on adolescents' alcohol use than paternal knowledge.

2. Data and methods

2.1. Participants and procedure

School surveys were conducted in the beginning of seventh grade in 2011 (T1; N = 9497; response rate 73%) and a follow-up in the end of ninth grade in 2014 (T2; N = 5742). All seventh-graders (12–13 years old) across comprehensive schools in the Helsinki Metropolitan area of Finland were invited to participate in the baseline survey (T1). The recruitment occurred through the educational authorities of the municipalities who gave permission for the study. The Ethical Committee of the

National Institute of Health and Welfare approved the protocol (National Advisory Board on Research Ethics, 2009). Because the study was a part of normal schoolwork, parental consent was not required. Two of the 14 municipalities did require parental consent statements, which were collected. An informational letter was delivered to the parents in the other municipalities. The same procedure was followed in both surveys.

Separate data sets were constructed for perceived maternal and paternal knowledge (all respondents did not have both parents). Only those who completed alcohol variables at T1 and T2 and maternal knowledge (N = 5197; 51.6% girls) or paternal knowledge (N = 5031; 51.3% girls) at T1 were included. Sample characteristics are presented in Table 1.

Table 1. Sample characteristics in two samples.

	Mother's knowledge	**Father's knowledge**	
Variable	**Estimate**	**Estimate**	**Scale**
Alcohol use			
T1 – no use, %	89.0	89.0	0–6
T2 – no use, %	46.4	46.4	0–6
Monitoring T1			
Mother's knowledge, *M (SD)*	8.16 (2.02)	8.17 (2.02)	0–10
Father's knowledge, *M (SD)*	7.01 (2.65)	7.02 (2.65)	0–10
Easy ease with talking to parents T1			
Easy with talking to mother, %	85.6	85.9	0/1
Easy with talking to father, %	73.0	73.1	0/1
Sociodemographics			
Gender			0/1
Girl, %	51.6	51.3	
Boy, %	48.4	48.7	
Immigrant background			0/1
Native, %	93.1	93.3	
Immigrant background, %	6.9	6.7	
With whom living			0/1

	Mother's knowledge	Father's knowledge	
Variable	**Estimate**	**Estimate**	**Scale**
With both parents, %	71.7	74.1	
Other type of living situation, %	28.3	25.9	
Parents' education			0/1
Other than university, %	62.7	62.0	
University, %	37.3	38.0	
N	5197	5031	

2.2. Attrition analysis

The follow-up captured less than a half of the original sample at T1. Several reasons for nonresponse were identified, the most prominent of which was absence during the survey (e.g., school absence; student attending a special needs class) which concerned about 10–15% of the students in each data collection. Absences had a stronger effect at T1, where two separate questionnaires were collected. The information about whether the pupil had refused to participate or was absent from school was not available from the participating schools. Special schools and classes for children with serious learning difficulties, intellectual disabilities or those situated in pediatric hospital wards were excluded because of the students' expected difficulty with answering the questions. Five schools in the city of Helsinki were omitted (330 students; 2.5% of total) for the reason of refusal (two schools), construction in the computer classrooms (two schools), and delayed delivery of individual passwords for the survey (one school). The other reasons for the nonresponses were the lack of parental consent statements at T1, and students' moving from the Helsinki Metropolitan area at T2.

Adolescents in the maternal knowledge data were compared with all of those who participated in T1 to check if the final sample represented the original one using the Mann-Whitney *U* test (the non-normally distributed variables). No significant differences were found in parental education-levels or the ease that children had in talking to their mothers or fathers. However, adolescents in the final data reported slightly lower degrees of alcohol use in seventh grade ($U = 22{,}285{,}885.5$, $r = 0.23$, $p < .001$), maternal knowledge ($U = 22{,}666{,}648.5$, $r = 0.23$, $p < .01$), and paternal knowledge ($U = 21186091$, $r = 0.23$, $p < .05$). The final data also included slightly fewer adolescents with an immigrant background (6.9% vs. 8.3%; $U = 23{,}224{,}808.5$, $r = 0.23$, $p < .01$) and those who did not

live with both parents (28.3% vs. 31.1%; $U = 22{,}712{,}144.5$, $r = 0.23$, $p < .001$). In summary, the final study population does not entirely represent the original population, but effect sizes of the differences were small, measured by rank correlation.

2.3. Measures

2.3.1. Alcohol use

Adolescents' alcohol use was measured by three questions: "Have you ever drunk beer, cider or other alcoholic beverages?" (0 = no, 1 = yes); "Do you drink alcohol nowadays? Count also small portions in, e.g., half a bottle of beer or cider" (0 = I do not drink alcohol, 1 = less than once a month, 2 = approximately once a month, 3 = twice a month or more) and "Have you ever been really drunk?" (0 = never, 1 = yes, once, 2 = two or three times, 3 = more than three times). Item ratings were added to a sum variable (scale 0–6; Table 1).

2.3.2. Maternal and paternal knowledge of the child's activities and whereabouts

Perceived maternal and paternal knowledge were measured by using the Parents' Monitoring Scale (Brown et al., 1993) on adolescent's behavioral control with five items on how much adolescents think their parents "really know" about their activities: "Who my friends are", "Where I am after school", "Where I go at night", "How much money I spend", and "Where I spend most of my free-time." The three options were (2 = a parent knows well, 1 = knows quite well, 0 = does not know at all). A total score was composed ranging from 0 to 10. The reliability of the sum variable for maternal knowledge was good for girls ($\alpha = .824$) and boys ($\alpha = .817$), as was the case for paternal knowledge (girls $\alpha = .886$; boys $\alpha = .884$).

2.3.3. Controlling variables

Immigrant background was measured by two questions: "In which country was your mother/father born?" and "Where were you born?" Immigrant status was opted for those, who themselves or whose parent(s) were born in a country other than Finland. The questionnaire contained one question concerning the family situation: "With whom do you live?" Those who reported living with both of their parents were coded as 1, others as 0 (Table 1). Parental education was asked separately for mothers and fathers. The highest level of either parent's education was used. University degree was encoded as 1, other options as 0. No mother or father was coded as a missing value (Table 1).

Ease with talking to a parent was operationalized as a question on how easy it was to disclose troubling things to the mother/father with the options "very easy", "easy", "difficult", "very difficult", "no mother/father" or "does not meet mother/father." The last option was coded as a missing value. The options "very easy" and "easy" were coded as 1, "difficult" and "very difficult" as 0 (Table 2).

Table 2. Gender comparison of alcohol use, parents' knowledge and easiness to tell parents.

	Girls		Boys				
Variable	**Median**	**M (SD)**	**Median**	**M (SD)**	**U**	**P-value**	**r**
Alcohol use							
T1	0	.22 (.79)	0	.27 (.91)	3,322,307.5	Ns.	–
T2	1	1.81 (2.12)	1	1.90 (2.20)	3297279	Ns.	–
Parents' knowledge, T1							
Mother's knowledge	9	8.34 (1.94)	9	7.98 (2.10)	3,021,402.5	< .001	0.22
Father's knowledge	7	6.86 (2.66)	8	7.17 (2.63)	2,929,702.5	< .001	0.23
Easy with talking to parents, T1		%		%	χ^2 (df)		
Easy with talking to mother	1	86	1	85.2	.778 (1)	Ns.	
Easy with talking to father	1	67.5	1	79	81.690 (1)	< .001	

Note: *U* refers to Mann-Whitney *U*-test, *r* refers to rank correlation, χ^2 refers to Pearson Chi-Square.

2.3.4. Statistical analysis

Descriptive statistics, non-parametric statistical tests, Spearman's bivariate correlation analyses among continuous variables and missing value analysis were performed in IBM SPSS statistics 23. The Mann-Whitney *U* test was used to test for differences in alcohol use and perceived parental knowledge between girls and boys caused by non-normally distributed variables. Effect sizes of the group differences were estimated by rank correlation. Three regression models were separately

accomplished for girls and boys in order to explore the direct and moderating effects of maternal and paternal knowledge at T1 on girls' and boys' alcohol use at T2. We included the direct effects of adolescent alcohol use at T1 and maternal or paternal knowledge and the interaction term in Model 1 in order to explore whether the perceived knowledge moderated the effect of alcohol use at T1 on alcohol use at T2. The more specific investigation of interaction was conducted using interaction plots aiming to determine whether the moderation of a parent's knowledge was accurate across the different levels of alcohol use at T1. Model 2 was a replication of Model 1 with the controlling variables of immigrant background, living situation, parents' education, and ease with talking to mother at T1 in the maternal knowledge model, and ease with talking to father at T1 in the paternal knowledge model.

Model 3 was conducted to compare the effects of maternal and paternal knowledge with each other on adolescent alcohol use at T2. The gender differences were compared using z-scores (Paternoster et al., 1998). In the comparison of the effects of maternal and paternal knowledge, the standardized regression coefficients were interpreted as statistically significantly different if the confidence intervals of 95% did not overlap. As the variables of alcohol use and monitoring were not normally distributed, we applied the regression and moderation modeling approach with Bayesian inference with no distributional assumptions as more appropriate, as opposed to traditional frequentist statistics (Muthén and Asparouhov, 2012). The Bayesian estimation with the Monte Carlo Markov chain (MCMC) was executed using the Mplus statistical package (version 8) with 30,000 iterations (Muthen and Muthen, 1998–2014). The potential scale reduction convergence criterion was used and the quality of the posterior distributions was verified using trace and autocorrelation plots. One-tailed significance testing for posterior estimates at the criterion-level of $p = .025$ was applied.

We included in the analysis of maternal knowledge those adolescents with complete data on maternal knowledge at T1 and the alcohol use variables at T1 and at T2. The analysis of paternal knowledge correspondingly consists of the adolescents with complete data on paternal knowledge and the alcohol use variables. The missing data was handled in Mplus through a full information maximum likelihood estimation (FIML) for Models 2 and 3. The missing data percentages in the variables were: immigrant background (.0% in the mother's and father's monitoring data), family situation (.4%, .4%), parents' education (.7%, .6%), easy to tell mother (1.1%, 1.6%), easy to tell father (6.1%, 2.9%), paternal knowledge (3.8% in the maternal knowledge data), maternal knowledge (.7% in the paternal knowledge data).

3. Results

Few adolescents (11%) had tried alcohol at age 13 and 64% at age 16. Alcohol use was similar among both genders (Mann-Whitney *U* test, Table 2). The correlation between alcohol use at age 13 and 16 was .411 for boys and .400 for girls (Table 3). At age 13, girls reported slightly higher levels of maternal monitoring than boys; boys reported higher levels of paternal monitoring (both $p < .001$; Table 2). Maternal and paternal monitoring correlated stronger among boys than among girls (.677 for boys, .611 for girls; Table 3). Disclosing troubling things to the mother was equally easy for girls and boys at age 13, but disclosing troubling things to the father was easier for boys than for girls ($p < .001$; Table 2).

Table 3. Bivariate correlations[a] for the continuous variables (boys in the lower left, girls in the upper right) (N = 5197).

Variable	1	2	3	4
1. Alcohol use, T1	1	.400***	−.255***	−.229***
2. Alcohol use, T2	.411***	1	−.272***	−.235**
3. Mother's knowledge, T1	−.245***	−.228***	1	.611***
4. Father's knowledge, T1	−.208***	−.219***	.677***	1

a

Spearman ρ. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

3.1. Parental knowledge in preventing increased alcohol use

According to Model 1, alcohol use at age 13 predicted significantly increased alcohol use at age 16 among girls and boys (direct effects $p < .001$; Table 4). Further, a higher level of maternal and paternal knowledge at age 13 predicted less alcohol use at age 16 (all $p < .001$; Table 4). These results remained stable when controlling for the variables of immigrant background, living situation, parental education, and ease with talking to mother/father in Model 2 (all $p < .001$). We also ran Model 2 including the mother's education only in the girls' model and the father's education only in the boys' model, but this did not yield any changes in *p*-values.

Table 4. Predictors of adolescents' alcohol use at the age of 16.

Explanatory variables at age 13	Model 1a		Model 1b		Model 2a		Model 2b		Model 3	
	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy
	b	*b*	*b*	*b*	*b*	*b*	*b*	*b*	*b*	*b*
	(*SD*)	(*SD*)	(*SD*)	(*SD*)	(*SD*)	(*SD*)	(*SD*)	(*SD*)	(*SD*)	(*SD*)
Alcohol use	.414***	.396***	.450***	.381***	.410***	.388***	.450***	.378***	.419***	.388***
	(.024)	(.024)	(.028)	(.022)	(.024)	(.025)	(.028)	(.022)	(.026)	(.025)
Mother's knowledge	−.214***	−.155***			−.214***	−.138***			−.187***	−.110***
	(.019)	(.019)			(.020)	(.020)			(.023)	(.024)
INT-M	.077***	.063***			.074***	.059***			.056**\	.042*
	(.017)	(.015)			(.017)	(.015)			(.022)	(.02)
Father's knowledge			−.149***	−.151***			−.143***	−.126***	−.05*	−.065**
			(.018)	(.020)			(.021)	(.021)	(.023)	(.026)
INT-F			.073***	.060***			.073***	.057***	−.031	−.030
			(.019)	(.017)			(.019)	(.017)	(.024)	(.023)
Immigrant background					−.031	−.018	−.024	−.010	.031	−.018
					(.017)	(.019)	(.018)	(.019)	(.042)	(.019)
Living with both parents					.028	.067***	.020	.045*	.043	.053**
					(.018)	(.019)	(.019)	(.020)	(.052)	(.020)
Parents' education					−.017	−.019	−.023	−.023	−.017	−.019
					(.017)	(.019)	(.018)	(.019)	(.017)	(.019)
Easy with talking to mother					.013	−.046**				
					(.018)	(.019)				
							.008	−.037		

Explanatory variables at age 13	Model 1a		Model 1b		Model 2a		Model 2b		Model 3	
	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy
	b (*SD*)	*b* (*SD*)	*b* (*SD*)	*b* (*SD*)	*b* (*SD*)	*b* (*SD*)	*b* (*SD*)	*b* (*SD*)	*b* (*SD*)	*b* (*SD*)
Easy with talking to father							(.020)	(.020)		
R^2	.183	.164	.166	.163	.187	.173	.169	.169	.188	.174
Model fit										
χ^2	.507	.487	.499	.517	.496	.490	.494	.498	.513	.499
BIC	28737.082	29402.136	27446.895	27825.489	58834.016	57698.476	55963.094	55090.523	52894.179	62162.312
N	2,684	2,513	2,581	2,450	2,684	2,513	2,581	2,450	2,684	2,513

Note: *b* = unstandardized posterior coefficient. *SD* = posterior standard deviation. INT-M = interaction of alcohol use and mother's knowledge. INT-F = interaction of alcohol use and father's knowledge. χ^2 = the Bayesian posterior predictive p-value. BIC = the Bayesian information criterion. Number of free parameters is 14 in Model 1, 44 in Model 2 and 54 in Model 3.

*p < .025.
**p < .01.
***p < .001, one-tailed.

In addition to the direct effects of perceived parental knowledge, regression models showed that the interaction of maternal and paternal knowledge with alcohol use at age 13 was a significant predictor of girls' and boys' alcohol use at age 16, although the moderating effect was quite small (Model 1; all $p < .001$; Table 4). The interaction effects were still significant beyond that afforded by differences in sociodemographic factors, ease with talking to mother/father (Model 2; all $p < .001$; Table 4), and other parent's knowledge (Model 3; all $p < .001$; Table 4). The closer examination of interaction plots revealed that maternal and paternal knowledge had parallel moderating effects among girls and boys (Fig. 1, Fig. 2). The interaction was significant at the low level of alcohol use at age 13 in all the models. This result indicated that parental monitoring at age

13 had slight protective effects on adolescents' alcohol use at age 16 when an adolescent had not used alcohol at all or her/his alcohol use had been very moderate or nonrecurring at age 13. However, parental knowledge did not have buffering effects on adolescents' further drinking when her/his alcohol use had been repetitive or she/he had been really drunk at age 13.

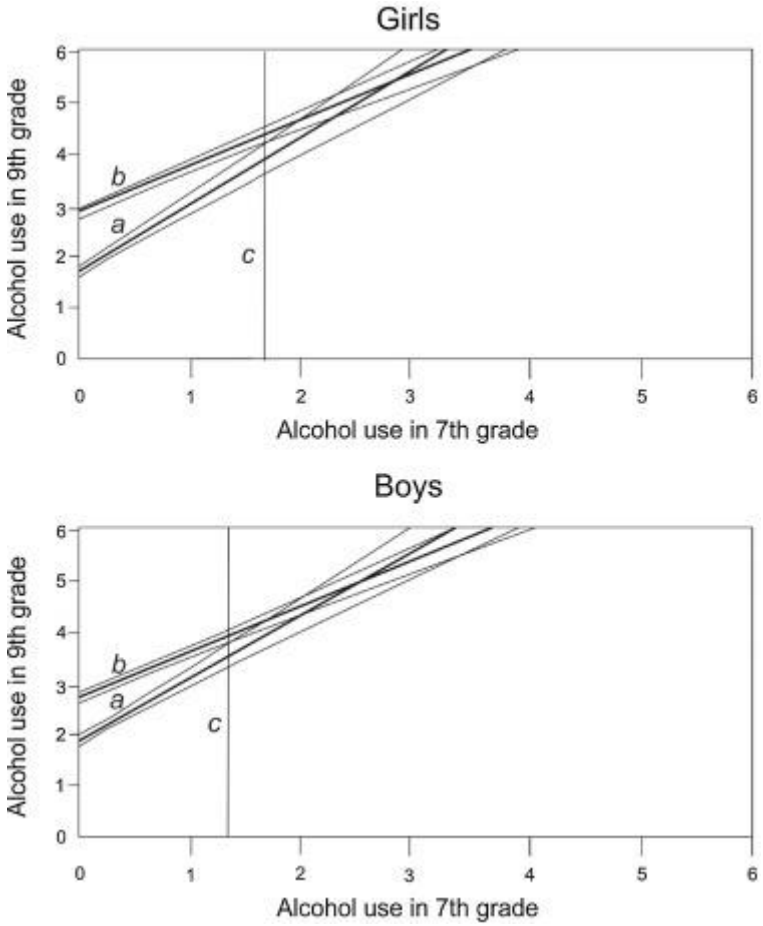

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Fig. 1. Interaction of maternal knowledge and alcohol use at the age of 13 predicting alcohol use at the age of 16 among girls and boys.

Note: Regression slope *a* illustrates alcohol use at the age of 16 when high level of mother's knowledge at the age of 13 (1 SD above mean). Regression slope *b* illustrates alcohol use at the age of 16 when low level of mother's knowledge at the age of 13 (1 SD below mean). Confidence intervals of 95% above and below the regression slopes. *c* illustrates the highest level of alcohol use at the age of 13 when the interaction was significant.

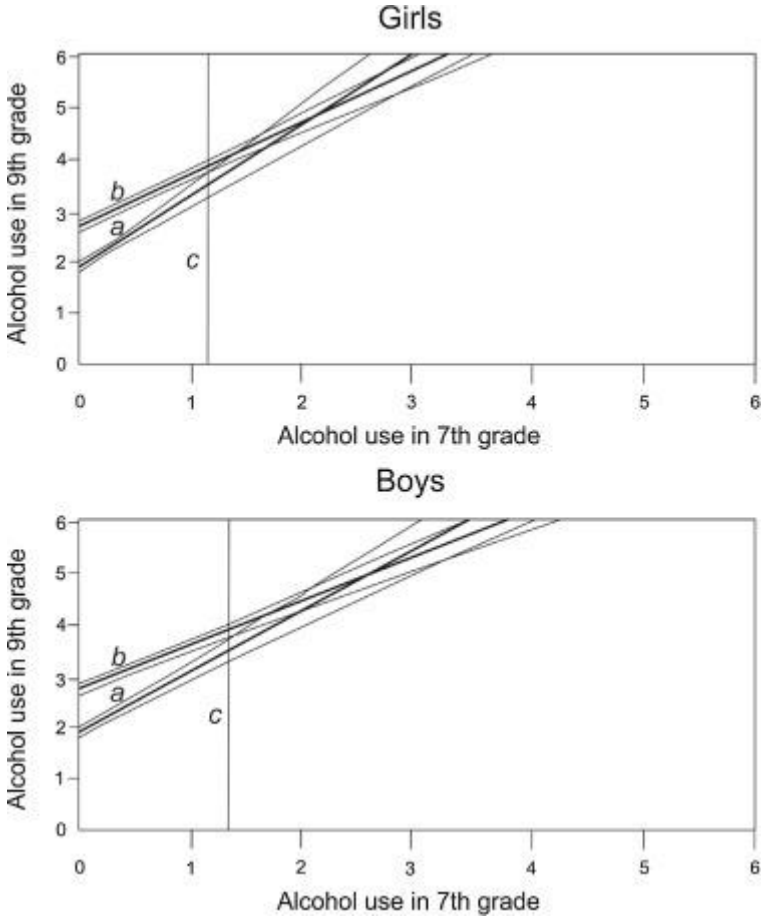

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Fig. 2. Interaction of paternal knowledge and alcohol use at the age of 13 predicting alcohol use at the age of 16 among girls and boys.

Note: Regression slope *a* illustrates alcohol use at the age of 16 when high level of father's knowledge at the age of 13 (1 SD above mean). Regression slope *b* illustrates alcohol use at the age of 16 when low level of father's knowledge at the age of 13 (1 SD below mean). Confidence intervals of 95% above and below the regression slopes. *c* illustrates the highest level of alcohol use at the age of 13 when the interaction was significant.

3.2. Comparison between girls and boys

Model 3 included both parent's knowledge, the interaction of each parent's monitoring with adolescents' alcohol use at age 13, and background variables (immigrant background, living with both parents, parents' education). The direct effects of perceived maternal and paternal knowledge

were significant among girls and boys. We compared whether parental knowledge had more of an effect on girls than on boys using the unstandardized coefficients (*b*). The direct effect of maternal knowledge at age 13 was equal on girls' alcohol use ($b = -.187$, SD .023) and boys' alcohol use ($b = -.110$, $SD = .024$; $z = -1.316$, $p = .188$) at the age of 16. Also, the direct effect of the father's knowledge was equal among girls and boys ($b = -.050$, $b = -.065$, respectively; $z = .432$, $p = .333$). In sum, the gender difference hypothesis was not confirmed.

We further compared whether the effects of maternal and paternal knowledge were equal on alcohol use separately for girls and boys (Model 3). We compared the effects of maternal and paternal knowledge with each other using the confidence intervals of standardized regression coefficients (*b**). Among girls, the confidence interval of the effect of maternal knowledge ($b^* = -.179$, CI 95%: −.222, −.136) did not overlap with that of the effect of paternal knowledge ($b^* = -.051$, CI 95%: −.096, −.005). That is, the direct effect of maternal knowledge was greater among girls compared to the direct effect of paternal knowledge. Among boys, the direct effect of maternal knowledge ($b^* = -.110$, CI 95%: −.157, −.062) was not greater compared to the direct effect of paternal knowledge ($b^* = -.063$, CI 95%: −.112, −.014), as the confidence intervals of the coefficients overlapped. The interaction term of maternal knowledge and adolescents' alcohol use at the age 13 was significant in both genders, but the interaction term of paternal knowledge and adolescents' alcohol use was not. Thus, maternal knowledge had a stronger buffering effect than paternal knowledge. To conclude, both parents' perceived knowledge had significant effects on adolescents' later alcohol use but the effect of maternal knowledge was stronger, especially among girls. R-square of alcohol use at age 16 was 18.3–18.8% for girls and 16.4–17.4% for boys in all three models.

4. Discussion

Our study confirmed the hypothesis that perceived parental knowledge is a strong protective factor against adolescents' alcohol use: the more adolescents experience parental knowledge of their activities and whereabouts at age 13, the less likely they are to consume alcohol at age 16. This result also confirms the findings emphasized in previous studies (Fletcher et al., 1995; Kim and Neff, 2010; Ryan et al., 2010; Simons-Morton and Chen, 2005; Yap et al., 2017). However, our study also showed that the buffering effect concerned only those who had not tried alcohol or who drank only moderately at age 13. Thus, perceived parental knowledge seems to be effective especially for abstinent adolescents or those who had only experimented with alcohol. An explanation for this might be that adolescents who use alcohol at very early ages expect potential

consequences and are thus less likely to disclose information on their whereabouts, or what sort of activities they engage in, to their parents.

Secondly, we analysed whether perceived paternal and maternal knowledge at age 13 had differing effects on boys' and girls' alcohol use at age 16. We expected perceived parental knowledge to be a stronger predictor of girls' drinking behaviour, but the results did not confirm our hypothesis. Our novel findings showed that perceived maternal knowledge had an equal effect on girls' and boys' drinking behaviour and that the result was the same concerning paternal knowledge. The interaction models showed that perceived maternal and paternal knowledge had a similar shielding pattern against the increase of boys' and girls' alcohol use by age, although the moderating effect was quite small. Previous evidence in longitudinal studies on whether the effects of perceived maternal and paternal knowledge are distinctive for boys' and girls' alcohol use is scarce. Results on other parenting factors, like parental involvement or quality of relationship, are inconclusive in terms of gender differences (Borawski et al., 2003; Choquet at al., 2008; Hubbard and Pratt, 2002; Kelly et al., 2011b; Rothbaum and Weisz, 1994). Future research is needed to address family dynamics and parental involvement in adolescents' lives both from the gender perspective and in the context of different family composition and in different cultures. In particular, studies on parental knowledge so far have been conducted mostly in North America and other western cultures, which to some extent share childrearing patterns and aims (Guilamo-Ramos et al., 2010).

Our third research question addressed the possible differences in the effects of maternal and paternal knowledge on adolescents' alcohol use. We found that perceived maternal knowledge had a slightly more buffering effect on the extent to which boys' and girls' alcohol use at the age of 13 predicted their alcohol use at the age of 16, especially among girls. Our third hypothesis was confirmed. A handful of previous studies on the gendered patterns of monitoring have agreed that mothers have more knowledge on their children's activities (Guilamo-Ramos et al., 2010). Our results are in line with the results of previous studies on this under-researched issue.

The main result of our study was that perceived knowledge by both parents protects adolescents from alcohol use. In the traditional family, fathers have been viewed as enforcers of discipline and child compliance, while nurturing and guiding and taking care of the emotional climate in the family has been a maternal task. The role of fatherhood has been changing and fathers nowadays take a more hands-on approach to raising children and spend time on both childcare and housework. This highlights the negotiating and democratic nature of parenting practices. It has been suggested that fathers matter in similar ways to which mothers matter, at least in the more egalitarian family

context found in western countries (Dette-Hagenmeyer et al., 2014; Pirskanen et al., 2016). In addition to the changing parenting practices and more egalitarian parental involvement, there is also evidence of change in how much adolescents' whereabouts are monitored. Gardner et al. (2009) reported that the proportion of parents who routinely asked their teenagers who they were with increased between 1986 and 2006 from 67% to 77%, indicating an increase in caring and communicative relationships between parents and children. These results are based on studies conducted in western countries with an emphasis on the UK, thus in quite similar childrearing and family contexts as our study. Our results add to the existing knowledge by providing evidence of equal contribution of both parents' knowledge to adolescents' alcohol use in a longitudinal research setting.

A strength of this study is the longitudinal data covering a whole age cohort in the Helsinki Metropolitan area. The follow–up period of three years covered the critical years of growing independence, reformulation of relationships with parents and peers, and a period of increasing experimentation with alcohol. Nevertheless, this study also has some limitations. We have used self-reported data from the students. Therefore, alcohol use might have been over-reported, as the school setting may foster exaggeration (Krumpal, 2013) but there is also evidence that self-reports of adolescent alcohol consumption and drunkenness may be regarded valid (Lintonen and Rimpelä, 2001). Our study comprises only students living in the Helsinki metropolitan area. This might compromise the generalizability to some extent, as the families in this area are better educated and wealthier than those in other parts of Finland (Statistics Finland, 2018). Our attrition analysis also revealed that the final study population did not entirely represent the original study population.

In conclusion, this longitudinal study provides new evidence on the effects of the parents' role in preventing their children's early initiation into alcohol use. The results can be used in child healthcare, school healthcare services and in family counselling to raise parents' awareness on how their knowledge of their children's whereabouts and activities seems to have a buffering effect on alcohol use and initiation.

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